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Of goats and humans; the societal costs of the Dutch Q fever saga

G. Morroy[1,*], J. Prins[2], R. Bergevoet[3], P. Schneeberger[4], H.H.J. Bor[5], W. van der Hoek[6], J. Hautvast[5], C.J. Wijkmans[1], J.B. Peters[5], J.J. Polder[7]

[1] *Municipal Health Service, Den Bosch, Netherlands*
[2] *SEO Economisch Onderzoek, Amsterdam, Netherlands*
[3] *Wageningen University & Research centre, Wageningen, Netherlands*
[4] *Jeroen Bosch Hospital, Den Bosch, Netherlands*
[5] *Radboud University Nijmegen Medical Centre, Nijmegen, Netherlands*
[6] *National Institute for Public Health and the Environment, Bilthoven, Netherlands*
[7] *National Institute of Public Health and the Environment Tilburg Universitiy, Utrecht, Netherlands*

Background: In the Netherlands, more than 4.000 human Q-fever cases and 19 deaths were notified between 2007 and 2010 during an unprecedented outbreak, implicating dairy goats as the main source. Veterinary control measures were taken reluctantly as economic damage was feared. Measures were introduced late, gradually increased and culminated in the culling of approximately 60.000 goats, 3 years after the outbreak began. Following acute Q fever 40% of working Dutch patients reported long-term (>1 month) sick-leave. One to two years after initial infection 40% of patients reported persisting physical symptoms and 60% a severely affected health status. Furthermore their general Quality of life (QoL) was affected in 44.9% of casus and 43.5% suffered from persisting fatigue. Growing numbers of Dutch patients are reported to develop late complications; Q fever fatigue syndrome or chronic Q fever, with implicit high costs to society. We estimated the societal cost of the outbreak by combining data from veterinary and human health sector sources.

Methods: Our cost data are based on real cost data on Qol, sick leave, health care use, complaints from patients notified in 2007 and 2008 and data from reports on the economic consequences of Q fever. Cost data were modelled and projected based on Q fever information from literature and Dutch data.

Results: The estimated projected societal costs of the Q fever outbreak amount to approximately 250-600 million Euros. Human costs account for 85%, are spread out over a decade and delayed. The largest costs are due to loss of QoL followed by productivity loss. Veterinary costs vary between 6% and 15% (depending on costs included) are much smaller but immediate.

Conclusion: Q-fever poses a serious persisting long-term burden on patients and society. The real impact of a zoonosis outbreak only becomes apparent when combining human health, societal and animal costs. Veterinary cost are immediate and therefore more apparent although proportionally small. Because of a slow trickle down effect human cost and societal implications tend to be underestimated. Finding the balance between economic veterinary interests and human health remains a challenge when dealing with future outbreaks of zoonotic diseases.

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Carriage of *Corynebacterium sp.* among contacts diphtheria in a low resource area in Indonesia (interim report)

Y. Mulyastuti*, D. Santosaningsih, A. Abdul Hamid, S. Santoso

Medical Faculty University of Brawijaya, Malang, Indonesia

Background: In 2011, outbreak of diphtheria had occurred in East Java Province, Indonesia. Little is known about factors associated with the outbreak. Carriage of *Corynebacterium diphtheria* might play a role to the epidemiology of diphtheria. This study aimed to investigate the risk factors related to *Corynebacterium diphtheria* carriage among contacts diphtheria.

Methods: Screening of contacts diphtheria was conducted during February to November 2011 in 5 sub districts in Malang city, Indonesia. Throat swabs were taken from contacts diphtheria in 2 playgroups, 10 kindergartens, 10 elementary schools, 5 high schools, and 5 primary health cares. The swabs were inoculated to PAI culture medium and incubated at 37oC overnight. Metachromatic staining (Neisser method) was carried out to the colony to identify *Corynebacterium sp*. Demographic data including gender, age, address, and screening location were collected.

Results: We screened 1739 contacts diphtheria in this study. 469/1739 (27%) were *Corynebacterium sp* positive. Logistic regression analysis showed that patients at the age of 19 and above and kindergarten screening location were associated with the carriage of *Corynebacterium sp* ($p < 0.01$ and $p < 0.05$, respectively).

Conclusion: Contacts diphtheria in Malang city was at risk to be carriage of *Corynebacterium sp*.

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Monkeypox detection in maculopapular lesions in two young Pygmies in the Central African Republic

E. Nakouné*, M. Kazanji

Institut Pasteur, Bangui, Central African Republic

Background: In June 2010, two Pygmy boys living in a settlement in the deep forest area of the southern Central African Republic (CAR) were found to have diffuse maculopapular lesions associated with pustules and crusts after eating a wild rodent.

Methods: High density resequencing microarray (RMA) developed at the Pasteur Institute was used with success to the detection of a large panel of pathogens such as *Monkeypox virus* directly from a child skin sample, respiratory and influenza viruses, rhabdovirus, arboviruses including Dengue, Chikungunya and West Nile viruses. In this study the RMA were used for the identification various types